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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,368	04/19/2004	Yasuhide Iwamoto	025720-00032	1079

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EXAMINER

SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/826,368

Applicant(s)

IWAMOTO ET AL.

Examiner

Barbara Summons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 14 and 16-18 is/are rejected.
- 7) ☒ Claim(s) 4-13 and 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/19/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 21, on line 33, note that "keen" should be - - keep - -. Appropriate correction is required.

Claim Objections

2. Claims 5 and 9 are objected to because of the following informalities:

In claim 5, the phrase on lines 3-5 lacks a verb, and - - is formed - - should be inserted either on line 3, after "which" or on line 5, after "circuit".

In claim 9, on line 2, "patters" should be - - patterns - -.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 16 and 18 are rejected under 35 U.S.C. § 102(e) as being anticipated by Ehara et al. U.S. 6,765,456.

Fig. 2 of Ehara et al. discloses a duplexer comprising: a chip 501 (see Figs. 13, 15 and 20) having first and second surface acoustic wave (SAW) filters 801 and 810

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with different center frequencies for transmitting and receiving, respectively (see e.g. col. 3, lines 55-56); a phase matching circuit (i.e. Tx and Rx branching circuits 825 and 820) that matches phases of the first and second SAW filters (see e.g. col. 4, lines 1-6); a package 502 that houses both filters and the phase matching circuit; the resonators of the first and second filters being arranged side by side in the SAW propagating direction (e.g. left to right in Fig. 20 or Fig. 13); and wherein the chip has pads (e.g. 840, 841, 846, 847 also in Figs. 13 and 20) that are located further out than the resonators (see also Fig. 15 which clearly shows the pads Tx and Rx further out than the resonators in filters 801 and 810 all on piezoelectric chip 501. Regarding the phase matching branching lines being in the package, they are either on the substrate (Fig. 13) or on the package (Fig. 15) or are bond wires 883 and 880 (Fig. 20) that will all be in the package. Regarding claim 18, see Fig. 2 and the title of the invention.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-3, 14 and 17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Taniguchi et al. JP 2002-141771 or its equivalent U.S. 6,919,777 taken in conjunction with Ikata et al. U.S. 6,501,344 (i.e. either in view of the other).

The Examiner will use the English language document US '777 when referencing text below.

Figs. 3, 4 and 14 of Taniguchi et al. disclose a SAW filter for use in a communication device (see e.g. US '777 col. 16, lines 60-64), wherein a chip of the SAW filter is face down mounted to bonding pads on a die attach layer, and discloses ground line patterns on the die attach layer (47-49 in Fig. 3) forming inductances L3-L5 (Fig. 4), and ground line patterns on an underlying layer see Fig. 14. Furthermore, Taniguchi discloses forming the ground line patterns on multiple layers anywhere in the package (see US '777 col. 14, lines 31-32), thereby disclosing a combination of the ground lines on the die attach layer and an internal layer connected by vias (see US '777 col. 14, lines 59-64). Regarding claim 3, 48/L4 has a different inductance value than 47/L3 and 49/L5 (see col. 10, lines 5-6), such that it must have a different width and/or length.

However, Taniguchi et al. does not disclose the particulars of a duplexer including two SAW filters with different center frequencies, a matching circuit and an antenna, etc.

Ikata et al. discloses a duplexer (Fig. 1) including two filters with different center frequencies and a matching circuit in the same multi-layer package (see e.g. the abstract) and discloses the filters with ground line inductances (see Fig. 10), wherein the duplexer is an antenna duplexer (see col. 10, line 43), thereby inherently having an antenna, and transmit and receive systems connected thereto in order for the device to function as an "antenna duplexer", although they are not shown in the figures. It should be noted that, although Ikata et al. does not explicitly show face down mounting of the SAW filter chip, it does disclose that face down mounting is known as a size reducing alternative to wire bonding (see col. 2, lines 29-38).

However, Ikata et al. does not disclose the inductances to ground (Fig. 10) specifically as ground lines on the package die attach layer and an underlying layer, but this was shown by Taniguchi et al. as discussed above.

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the duplexer and matching circuit of Ikata et al. by having face down mounted the SAW filters and provided the inductances to ground from the SAW filters as ground lines on the die attach layer and an underlying layer as taught, for example, by Taniguchi et al., because of the explicit suggestion by Ikata et al. that face down chip mounting would have provided the benefit of size reduction (*ibid.*), and because of the explicit suggestion by Taniguchi et al. that providing the inductances to ground as ground lines in the package as shown would have provided the benefits of increased pass band width and increased attenuation in the vicinity of the pass band (see US '777 the paragraph bridging cols. 8-9) while

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maintaining a small size due to bump bonding (US '777 col. 1, lines 53-55) and replacing the inductances previously provided by wire-bonding with the ground lines in the package (US '777 col. 2, lines 15-30).

Additionally, it would have been equally obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW filter of Taniguchi et al. by having provided it in a duplexer with two SAW filters and a matching circuit in the same package in view of the explicit suggestion to do so by Ikata et al. (Fig. 1 and the abstract), and because Taniguchi et al. explicitly suggests its filter for use in communication devices in portable phones (US '777 col. 16, lines 62-64) which one of ordinary skill in the art would have known included antenna duplexers such as that shown by Ikata.

Allowable Subject Matter

7. Claims 4-13 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Taniguchi JP 2003-051731 discloses a SAW duplexer with two SAW filters side by side in a SAW propagation direction and with pads further out than the resonators.

Takamine U.S. 6,606,016 (Fig. 14) and Sawada U.S. 6,720,842 (Fig. 26) each disclose duplexers with two SAW filters side by side in a SAW propagation direction.

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Ikata et al. U.S. 5,561,406 is an equivalent of a JP document cited by Applicants.

Muramatsu U.S. 6,756,864 discloses a SAW duplexer and matching circuit in a package with inductances formed in layers of the package.

Satoh et al. RE 37,375 discloses forming inductances from parallel resonators in a SAW filter to ground as ground lines on the package (see Fig. 42).

Ohashi U.S. 6,489,860 also discloses a SAW duplexer and matching circuit in a package with inductances formed in the package.

Takahashi et al. U.S. 6,351,194 provides further evidence that it is known to provide two SAW filters face down mounted and a matching circuit in a package.

Iwamoto et al. U.S. 6,466,103 and U.S. 6,919,778 and U.S. 2004/0155730 have a common inventor with the instant application and deal with SAW duplexers packaged with matching circuits.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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September 1, 2005


BARBARA SUMMONS
PRIMARY EXAMINER